JPRS-WST-84-019

7 June 1984

West Europe Report

SCIENCE AND TECHNOLOGY

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WEST EUROPE REPORT
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AEROSPACE

BRIEFS

SPOT INSTRUMENT TESTING--Paris--The last qualifications being carried out on the high-resolution visible (HRV) instruments for the SPOT satellite, will be completed during the summer of 1984 together with the delivery of the first two instruments following qualification. While the mechanical, optical, and thermal configurations of the instrument were already completed and certified in 1981, the same was not true for the detection package, nor for the electronic processing of detector signals. These two subassemblies, definitely among the most complex ones in the satellite, have been plagued by serious technical difficulties up to the qualification model. The qualification models have successfully completed their test sequence, writes MATRA 7 JOURS, the company's information bulletin, making it possible to declare them flightworthy. The final integration and test sequence for the SPOT-1 instruments started at the MATRA Toulouse center, and SPOT-2 activities are already taking their turn. MATRA 7 JOURS even adds that after SPOT-1 and SPOT-2 the time has come to think about SPOT-3, a second generation satellite equipped with a channel in the intermediate infrared, which should be offered at the beginning of the next decade in order to provide improved service for all image users. [Text] [Paris AFP SCIENCES in French 26 Apr 84 p 19] 11,023

CSO: 3698/421

AUTOMOBILE INDUSTRY

DP NETWORK LINKS FUNCTIONAL AREAS AT DAIMLER-BENZ

Duesseldorf HANDELSBLATT in German 21 Mar 84 p 25

[Article by Waldemar Schaefer: "Manufacturing Technology/With Flexibly Automated Equipment an Industrial Enterprise Can React More Readily to Market Changes: Data Processing Network Links Functional Areas"]

[Text] A great part of the billions invested by the Daimler-Benz Company went last year to manufacturing. One of the most important goals achieved in the interim was the goal of meshing the domestic plants into a manufacturing association.

The manufacturing association yielded high flexibility which prevented short-shift work or job losses in the German plants even in the face of fairly large fluctuations in demand--such as occurred in consequence of worldwide sales problems related to transport and trucking services. In conjunction with the manufacturing association efforts have been made in model development to provide that both in the case of passenger cars and also in the case of commercial vehicles it should be possible to produce in large batches parts which are interchangeable for as many models as possible.

Moreover, vehicle development, work preparation, manufacturing control, quality control and material economics have been linked ever more closely through a data processing network. This should not only create rational operating procedures but also minimize inventory and also facilitate quality control. In machine equipment there is progressively more and more use of "flexibly automated equipment," which means industrial robots.

"With flexibly automated equipment we can react to market changes and permit technologically based production improvements to flow continuously into the mass production process." But as production chief Dr Werner Niefer emphasizes this principle in the manufacturing technology philosophy of the Daimler-Benz Company encounters "a distinct and unavoidable limitation as soon as quality requirements can no longer be met." For this reason the use of industrial robots at Daimler-Benz will continue in the future to be substantially less extensive than among Japanese or even German competitors.

Model-Related Equipment Assures Maintenance of Dimensions

As an example Niefer points to car body construction. Here today it is state of the art for industrial robots to perform spot-welding operations whenever the assembly line size and the spectrum of variants makes this economically possible. However, in a long series of tests Daimler-Benz has established that the dimensional consistency of the car bodies can be maintained within self-established specifications when the decisive fastening process--the first stage in constructing the basic car body out of components--is carried out in a welding apparatus designed to suit the particular model.

Accordingly the Daimler-Benz solution is this: flexible framework manufacture--as a combination of model-related manufacturing equipment with flexible manufacturing devices. Therefore, for example, in the Sindelfingen Automobile Body Plant where passenger cars are produced model-specialized welding assembly lines are employed in addition to industrial robots.

The design of the manufacturing facilities is characterized by the high standards governing quality. But in addition the high capital cost for this equipment makes it necessary to pay close attention not only to the primary goal of quality but also to full utilization of the facilities.

Effective instruments in achieving both these goals are computer-supported diagnostic systems and surveillance systems. According to the Daimler-Benz chief of production these systems provide "the production and maintenance personnel with objective data about the state of the facilities." Causes of breakdown in the facilities would be systematically analyzed and the maintenance man rapidly summoned to the source of the trouble. There would be substantial reduction in equipment shutdown times.

Regularly arising errors could be reliably detected with this system and weak spots in the equipment corrected. Automation, according to Niefer, would thus lead to greater manufacturing reliability. It would supply an essential contribution to the uniform and uninterrupted sequence of production and thus to a constantly high quality in the products.

Although so much expense is devoted to protection of the production process and of the production facilities, nevertheless quality control continues to be a necessary constituent of current production. In automatic measuring and testing apparatus the dimensional constancy of individual parts and the functioning of entire systems is kept under surveillance; quality data acquisition takes place via computers which also process the data and evaluate it.

Data Go to the Supplier on Magnetic Tape

After intense efforts an association has been created through which the "primary dimensions" of the development are fed directly both into the production machines and also into the measuring machines. The measuring tools are also manufactured directly in accordance with the primary dimensions of the development. In the next step, which has already been initiated, these primary measurements are also transmitted directly to the suppliers in the form of magnetic tapes or punched tapes.

According to Niefer automation of quality control makes it possible through prompt response to early recognized trends in the manufacturing output to control the quality of the product under all circumstances. In view of this high level of automation which has been attained not only in automobile body construction but also in systems manufacturing and in the painting process one might draw the conclusion that quality depends only upon investment size and the consequent level of automation.

However, Niefer contradicts this emphatically. It is true that a high level of automation does improve the prerequisites for the attainment of quality, but an essential parameter may be overlooked here. Development planning and operation of the production facilities are directly dependent upon the state of knowledge and the degree of engagement of the planning and managing people.

To this end one urgently requires the well-trained employee who creatively and pragmatically determines the optimal solution, plans the details of this solution and transforms them logically into engineering. Even when equipment technologies are basically the same details of design and the way in which use of the facilities is planned has a decisive effect upon success. Thus these things can have a decisive influence upon the competitive capability of a production sequence.

In Niefer's opinion future developments will be characterized by a progressive interpenetration of data processing into all areas of manufacturing. Data processing will make data accessible both in the organizational domain and also in the control of production facilities, all at the touch of a button. Among the tasks of the future there is that of installing flexibly automated assembly equipment; this is a challenge both to manufacturing engineers and to product developers.

8008
CSO: 3698/412

VENTURE CAPITAL INITIATIVES IN FRG

New Firms Enter Market

Paris BIO LA LETTRE DES BIOTECHNOLOGIES in French Feb 85 p 5

[Text] New venture capital companies have just been formed in the FRG: Techno Venture Management Gesellschaft (Munich), with initial capital of 130 DM, specializing in minority share aquisitions in new companies with high growth potential, particularly in the area of biotechnologies and bioelectronics in the FRG, the United States, and Japan. The company has already placed 15 million DM. Investments of this kind will have an average term of 10 to 15 years. Shareholders are the following: Beteiligungsgesellschaft (Siemens) 25 percent; Matuschla Group/TRV (Munich), 25 percent; TA Associates (Boston), 25 percent; Advent Management (London), 5 percent; Techno-Venture Management Partners, 20 percent.

The Matuschla/TRV international investment company has already in vested 300 million DM in the United States and United Kingdom in cooperation with TA Associates and Advent Management. TA Associates is one of the biggest American investment companies with more than $1 billion in capital and shares in more than 150 high-tech enterprises.

The president of Techno Venture Management is Mr Peter A. Brooke, who also heads TA Associates in Boston.

The second is Venture Capital Beteiligung Beratung Entwicklung AG (Stuttgart), initially capitalized at better than 20 million DM, whose prime orientation is toward biotechnology, geretic engineering, biochemistry, energy, medicine, pharmaceuticals, and the environment. A score of investment projects are contemplated with share aquisitions as high as 50 percent for better control over R&D. The company will use the services of independent counsel and those of IC Unternehmens Reratungs AG.

University-Industry Ties Established

Paris BIO LA LETTRE DES BIOTECHNOLOGIES in French Feb 84 p 14

[Text] A number of German industrial companies have joined forces with universities with a view to exchange of services and input of venture capital. One of the more elaborate examples is that of TechnologieZentrum, at Stuttgart University, where several companies and individual entrepreneurs have set up shop and are sharing facilities.

A decision was reached last year to set up a similar facility, at an initial cost of 30 million DM, on the Heidelberg campus; it would center on biotechnologies, genetics, and medical technology. The German Ministry for Research will finance the project, which will be managed by the State of Baden-Wurttenberg with a budget of 17.5 million DM.

The BASF Group, which had put out 5 million DM to pay for the project draft, has announced that it will advance an additional 5 million DM over a period of 5 years beginning in early 1987. Those funds will be earmarked primarily for staff recruitment.

6182

CSO: 3698/415

BRIEFS

EUROPEAN BIOSENSOR MARKET EXPANDING -- A recent study by the Information Research agency in London reports that Western European bioresearch accounts for 45 percent of the world market. The overall volume of business is assessed at $630 million, for a world total of $1.4 billion. Non-isotopic immunological sensors should experience the fastest growth: ± 22 percent per year. Prenatal and infantile diagnosis, cure and detection of sexually transmissible diseases (MST) should be the areas with the highest potential for growth, The more promising fields here include that of diagnostic tests for various kinds of cancer, screening blood products, and monitoring cardiac disease. The study cites the features of current diagnostic techniques and the products involved. [Text] [Paris BIO LA LETTRE DES BIOTECHNOLOGIES in French Feb 84 p 10] 6182

BIOGEN, NOVO TRADE IN U.S.--Two European companies involved in biotechnology have enjoyed capital increases this year on the American stock market from share offerings totaling $161.25 million: Biogen (Swiss) on 22 March 83, issue placed at $57.5 million; Novo Industri (Denmark) on 14 April 1983; offering placed at $103.75 million. The main reason for these operations is the keen interest, and hence the greater perceived value aroused in the United States in shares in the biotech sector, as well as the size of the American market by comparison with the exchanges in these companies' home countries. The price foreign companies have to pay for placing their shares in the United States is relatively high, however: they must conform to American bookkeeping practices and abide by SEC regulations governing information to be provided to shareholders. Heavy buying of foreign stocks by American pension funds and individual investors since the end of 1982 has made Novo's principal market the United States. [Text] [Paris BIO LA LETTRE DES BIOTECHNOLOGIES in French Jan 84 p 4] 6182

CSO: 3698/415

CIVIL AVIATION

AI SALES HEAD DISCUSSES PLANS FOR TA-11 LONG-RANGE AIRBUS

Stuttgart FLUG REVUE in German Mar 84 p 55

[Article by Horst Rademacher: "Partners Overseas?"]

> [Text] The battle for the long-range aircraft market is well under way. For new variants Airbus Industry is looking for partners with plenty of capital.

The European Airbus Industry in either the short or the long run is not going to get along without cooperation with aircraft companies overseas. This view was expressed by the chief of sales of that company, Pierre Pailleret, recently in Toulouse. He did not even exclude the possibility of cooperation with plants in the People's Republic of China.

In the British press there had been rumors that Airbus was about to cooperate on its project A 320 with its toughest competitor, Boeing in Seattle. The reason: the aircraft manufacturer, British Aerospace, is still unable to decide whether it will participate in the development of this 150-place two-engine jet.

No Cooperation With Rival Boeing

Because Margaret Thatcher has reservations. She warned against a bankruptcy like that of the supersonic aircraft Concorde. Pailleret is also of the opinion that Europe's aircraft industry could not tolerate one more such debacle. But development of the A 320 is now a matter of survival if Airbus at the start of the coming decade is to have a mature product to replace what will then be the obsolete Boeing 727 and 737 as well as to replace the McDonnell Douglas DC-9.

Pailleret--like Boeing, too--excluded the possibility of cooperation with the U.S. manufacturer: "We find ourselves in a war with Boeing, in a war for shares of the market."

But Pailleret also emphasized that the Airbus product palette must be expanded. "The smaller the offering," said the sales chief, "the more vulnerable is the company. Therefore, he said, it is necessary in the not too distant future to begin developing the long-range aircraft TA 11 for which

the first designs have already been in existence for 4 years. This four-engine aircraft would provide seats for about 180 passengers.

"The essential novelty in this aircraft," according to Pailleret, "will be its wing. For its fuselage we can go back to elements in Models A 300 and A 310." But in the opinion of the sales chief it would not be economically possible for any of the European Airbus partners to undertake, in addition to the risk of A 320 production, also the challenge of wing development for the TA 11. Pailleret: "For this reason we must turn to competent partners outside Europe having sufficient capital and engineering competence to take over such a development."

Along these lines according to the chief of sales one might consider McDonnell Douglas, Japanese, Canadian or Australian companies. Neither will Pailleret exclude the possibility of cooperation with the People's Republic of China. He does have to admit certainly that such intercontinental cooperation would bring with it enormous engineering and logistic problems. Just for production of one A 310 the "Superguppy" transport airplanes must spend 45 hours flying inside Europe just to fly the components to Toulouse. "But such problems can also be solved overseas," in the opinion of Pailleret.

At the moment Airbus Industry, which has just taken over a new administration building in Toulouse, is still a long way from turning a profit. The company will reach the break-even point when it has sold about 650 aircraft of the types A 300 and A 310. But up to now just 240 aircraft have been delivered to the customers.

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CSO: 3698/412

DISCUSSION OF IBM COMPATIBILITY ISSUE AT SIEMENS

Hamburg DIE ZEIT in German 23 Mar 84 p 23

[Article by Hermann Boessenecker: "Siemens in a Tight Spot: The Electronics Concern Is Adapting Itself to IBM, Which Dominates the Market"]

[Text] This sort of thing could happen in no other branch of business: a loyal customer which for decades had used with general satisfaction the products of a particular firm now decides at one stroke to switch to the product of a competitor. In data processing such decisions are not unusual.

But this decision was especially hard for the Dresden Bank which up to now was worldwide the largest computer customer of the Siemens Electronics Company. The financial institution had to decide whether no fewer than 3,000 programs with which about 5,000 terminals in 1,000 business offices are connected to the Frankfurt central office would be "rewritten" for the new Siemens operations system (BS 2000). Or would tribute have to be paid to powerful IBM by transferring to their operations system for the highest computing level (MVS = Multiple Virtual System). By "operations system" is meant the control instructions supplied by the manufacturers in fixed system programs ("software") for communication with the machine ("hardware").

The Dresden Bank was confronting a decision which—according to organization chief Walter Gruhn--would range far beyond one decade. If despite its "great satisfaction" with Siemens the bank were to change over to the IBM system then this would be for two reasons: "We would thereby obtain greater security and a larger market." The IBM standard is recognized today far and wide as the "world standard." Thus most computer manufacturers accommodate themselves to the giant and attempt to make their machines compatible with those of this dominant figure in the market and thus capable of being linked together easily.

It is true that IBM is in no sense the most innovative computer builder, but with a market share which worldwide is decidedly greater than 50 percent it prescribes the rules of fitness to the data processing industry. And IBM is always good for surprises. "The Siemens people tell us what they are planning to make in 3 years so that we can get ready for it," says Gruhn in describing his experience. "IBM on the other hand says absolutely nothing and then suddenly surprises everyone with some new device."

This independent policy has made the computer giant continually more successful. It is extremely difficult to get a clue to the long-term strategies of the manufacturers whose colossal products equip the computing centers of industry and of business, of banks and of insurance companies. The systems of the individual suppliers have been in the past and continue to be combinable with one another only to a limited extent and no one knows today what the competition will bring out tomorrow.

Therefore never before have the managers of the data processing divisions in large German enterprises preoccupied themselves so intensively with the future of their activity and thus given so much thought to imminent investment decisions as they do today. Especially those enterprises which like the Dresden Bank have in recent years relied upon Siemens computers are now forced to make a difficult decision. They would have to know right now with certainty how Siemens is going to operate in the next 5 to 10 years and with what other systems its large-scale computers will be permanently compatible.

Two years ago after many years of going it alone Claus Kessler, who was then the new Siemens computer head, gave the first sign of a return to the IBM world. At that time Kessler announced that by the middle of the eighties he planned to so reconfigure Siemens operations system (BS 2000) that it would be able to operate also with the computers (Series 7800) which are produced its Japanese cooperative partner Fujitsu and which are compatible with IBM.

This statement of Kessler's was designed primarily to maintain on the Siemens track those customers who have installed computer models of Siemens in-house "family" (7500) and who may possibly desire in the relatively near future to switch over to the more efficient Jumbos from Japan without thereby having to dispense with the special company-related user programs on which they had expended so much money. By means of the "section site," receiving counsel from Siemens, it was expected that customer programs would function both on Fujitsu computers and IBM computers.

This announcement was generally understood to mean that Siemens was thereby executing a spectacular about-face and was once again approaching the IBM standard--as a necessary piece of survival strategy in a market dominated by a world champion. Only a few months ago Kessler, who starting on 1 April, has been responsible for the new--larger--company area called "Communications and Data Technology" expressly declared that he was supporting such a planned policy of compatibility: "In communications technology an open world is expected as a matter of course; we must achieve the same open world in data technology."

In the meantime it appears that in the house of Siemens there are already regrets for having made such wholesale commitments and concessions and there is talk of "misinterpretations" by trade journalists. But most of the computer bosses of large companies have interpreted the compatibility assurance in this sense: interchangeability in both directions. In other words the possibility that in the future Siemens computers could also be integrated into the IBM operations system. The big customers who do not yet entirely trust the competitive capability of Siemens, the computer manufacturer, in the face

of continuously changing markets would like to have an absolute certainty of this type.

But for Siemens such a complete IBM compatibility at the user level appears to be impracticable and from the point of view of competition would probably not be desirable in the first place. "That would be out of the question," says Siemens director Reinhard Veelken concisely. Undoubtedly the company's future as an autonomous manufacturer of computers is at stake. If one offers no compatibility then one is closing oneself off and one has no chances of penetrating into the customer circle of the market champion. For this reason Siemens years ago signed its contracts with Fujitsu (which still run until 1989) and has been importing from Japan a "second family" to round out its own product palette. But it is urgently necessary now that Siemens increase the performance capability of its own 7500 computer "family." "Here quality grows from below," is the laudatory remark of a very critical observer.

If, too, one were to switch over with this latter series entirely to a position of compatibility with the market leader then there would be a great danger that even satisfied customers might from time to time be seduced by the siren songs of companies who offer IBM-compatible equipment (IBM itself, Amdahl, and others) and who are always ready to find a proposition which would make a changeover quite palatable--usually through price concessions. Be that as it may, according to earlier information Siemens has put almost a quarter of a billion marks of government support money into its own operations system. And so no one wants to devalue such an investment precipitately by crossing over to IBM with all flags flying.

But the restrictive strategy aiming at market preservation is consistent with the efforts of numerous data processing managers to program the future reliably. That was the problem confronting the Dresden Bank. Since IBM will always remain the great unknown in the market and no one knows with what finesses and moves on the chessboard "Mother Blue" is going to irritate and unnerve its competitors and its customers, the connection with IBM is looked upon as vital. And certainly none of this is going to be changed by the agreement into which Siemens has entered with 11 other European manufacturers. It is the goal of these manufacturers to uniformize their engineering standards in data technology and to establish "section sites" at which the systems may be combined. But as long as IBM is not a party to their efforts these efforts will be but halfway measures at best.

Thus there is demanded of the Siemens concern a balancing act between the indispensable bond with IBM on the one hand and some residue of autonomy on the other--a compatibility in small doses so to speak. For Siemens it is the challenge of the decade.

At the same time the company is involved in a mesh of cooperative engagements which it must take into consideration. Last month there was a furor over a new contract with the sharpest IBM competitor for the delivery of large-capacity magnetic disk memories. When it became known that IBM is selling these so-called thin-film disks to Siemens as much as 20 percent more cheaply than to IBM's own sales organization the sales representatives of IBM--in the words of COMPUTERWOCHE--"went to the barricades."

The latter trade journal asks whether Siemens through such a supply agreement is not getting into "a technological dependency which can in the end be fatal"? On the other hand people at Siemens point out the advantages of the transaction: "We are receiving the most modern product at a good price."

To informed observers there is no doubt that through its agreement with IBM the relationship between Siemens and Fujitsu (who had previously supplied the disk memories) has been overshadowed and weakened. Veelken concedes that his people are not "really upset" at being now "less dependent" upon the Japanese.

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CSO: 3698/395

BRIEFS

NUMBER OF UK ROBOTS--London/Bucharest (VWD). The number of installed industrial robots in Great Britain increased in 1983 comapred to the previous year by 52 percent to 1,753 units. British manufacturers' share of the domestic market climbed from 23 to 34 percent during the same period. According to reports of the Association of British Robot Manufacturers /BRA/, a good third of the 601 robots put into operation last year stemmed from domestic production. The tally of robot producers presently stands at 58; the largest is a branch of the American firm Unimation, a Westinghouse subsidiary. The utilization of industrial robots in the Monarchy is presently concentrated in the automobile and machine-building industries. For manufacturing these robots, three Japanese-British joint ventures have been established. /Excerpts/ /Munich COMPUTERWOCHE in German 16 Mar 84 p 6/ 9160

CSO: 3698/400

REVENUE, R&D IN MICROWAVE COMPONENTS BRANCH OF THOMSON

Paris INTER ELECTRONIQUE in French 13 Feb 84 p 13

[Article by J.P. Feste: "Gallium Arsenide Gate-Array Circuits For 1985"]

> [Text] The Microwave Components Division (DCM) of Thomson-CSF is expected to complete in 1985 the installation of a system that would make it possible to interconnect gallium arsenide gate-array circuit components. Gate-array circuits will consist of two metallization levels and 500 gates on a 3 x 3 mm chip.

At a press conference on 30 January, the division managers emphasized the importance of anything that has to do with microwaves, with respect to analog as well as to logical circuits: the latter could assume considerable importance in 1987 if high-speed computer development is expanding.

GaAs Gate-Array Circuits

The GaAs gate-array circuit that the Thomson DCM would be able to characterize within eight weeks or so, using the mask tape supplied by the client, is a low-impedance output circuit with a BFL (Buffered FET [Field-Effect Transistor] Logic) structure. The technology used achieves a compromise between speed and power. Consumption should range from 1 to 7 mW per logic gate, and speed from 100 to 300 ps, depending on the application. The characterization system library already includes 50 logic cells which, including the buffers, allows for 40,000 logic functionalities. DCM is currently developing this library, and the first functional circuit could be ready in about 3 months. The development of such a tool, which has become necessary to manufacture circuits, in particular for signal processing, cannot be supported by the knowhow acquired with the existing tools used for silicon; first, because of the special character of the material used, GaAs; and second, because the high speeds involved require special layout and connection designs, any connection being naturally a logic circuit with a distributed constant. DCM is expected to have GaAs integrated circuit prototypes ready by 1985. For specific custom-designed circuits, the yield could be as high as 10 percent and the production volume 25,000 circuits per month. However, if high-speed computers are developed, larger series could be involved.

Component Research and Development

In addition, DCM is developing microwave components such as diodes, field-effect transistors and optical components. Research and development is done for each of its product lines. "Beam lead" and 3000-V PIN [expansion unknown] diodes and 94-GHz avalanche diodes are being studied, as well as 94-GHz Gunn diodes--the only type of components that can oscillate at such frequencies with an acceptable phase noise--Schottky diodes to be used between 2 and 40 40 GHz and at 94 GHz as "beam lead" diodes, indium phosphide Gunn diodes and Impatt diodes for impulsional J-band applications. As far as transistors are concerned, new developments involve the Recess structure for power components (1W at 4-12 GHz) and low-noise amplification components (2 dB at 12 GHz and 9-dB gain). Research involves power components (3 W up to 8 GHz), the TegFET structure and the development of low phase-noise oscillators for Doppler radars, in collaboration with the LAAS [Automation and Systems Analysis Laboratory] of the Paul-Sabatier University of Toulouse. DCM completed the final design and a model of this oscillator (See INTER ELECTRONIQUE, 16 January 1984).

Research on optical components involves essentially a manufacturing technique based on epitaxy and using organometallic compounds and the development of a quantum-well laser diode whose main characteristic is its low threshold current density: 120 A/cm^2 and 230 A/cm^2 for respective Fabry-Perot resonator lengths of 1.8 and 0.4 mm.

DCM 1983 Sales: 348 Million Francs

The Microwave Components Division of Thomson-CSF is distributing its activity as follows: 41.4 percent for hybrid circuits, 33.6 percent for gyromagnetism, 21 percent for hyperfrequency diodes and 4 percent for miscellaneous components. The division employed 850 people and achieved sales of 348 million francs in 1983, representing 6.1 percent of the sales of the Electronic Components Branch. Investments amount to 66 million francs or so, and research represents 39 percent of sales. 1983 sales were approximately 30 percent higher than in 1982 and should increase again slightly in 1984.

Activities of the hyperfrequency microelectronics department account for some 100 million francs, including 25 percent for research; those of the components department for 114 million francs, with 82 percent for research (a high percentage due to considerable research on III-V semiconductors); and those of the gyromagnetism department for 134 million francs, including 11 percent for research.

9294
CSO: 3698/418

MICROELECTRONICS

REVIEW OF COMPUTERS, SOFTWARE, PERIPHERALS AT HANOVER FAIR

Paris L'USINE NOUVELLE in French 3 May 84 pp 91-93

[Article by special correspondents in Germany, Jacques Antoine and Charles Kercy: "The Hannover Fair; Programmable Controllers, Computers, Software: Too Much To Choose From"]

> [Text] New 32-bit super-minicomputers, including the first French model, integrated-memory programmable controllers... With steadily increasing performances, manufacturers are now betting on power.

Leaving the CEBIT, the integrated data processing show at the Hannover Fair, clutching brochures collected here and there from over 1,300 exhibitors, the visitor remains confused. What computer should he choose? What software package? They are legion and they are often as alike as two peas in a pod. In brief, there are just too many microcomputers today, and that does not help.

Engineers or scientists visiting the fair will not fail to ogle the new models of large all-purpose computers, especially the 32-bit super-minicomputers. Large computers from NAS [expansion unknown] which was introducing its 80X3 line, 6 machines from Hitachi with performances 20 percent or so better than those of its competitors' top-of-the-line computers, i.e. the IBM 308-X series. Super-minicomputer from Digital Equipment Corp [DEC], the undisputed leader of the game with its Vax series. Indeed, the world Number 2 in computers was introducing the Vax 11-785 and showing its recent Vax-1 microcomputer. With a performance level estimated at 1.7 million instructions per second [Mips], the 11-785 model offers a power at least 50 percent higher than that of the 11-780, the previous leader of this line, with which it can be made compatible through a migration kit. Thus, DEC was aligning itself on its competitors which are already offering machines with over 1.5 Mips: Data General (Eclipse MV-10000), Prime (9950), IBM (4341-12) or again Gould Sel (Concept 32-67, 87 and 97). We should also mention that the latest Gould-Sel machine, the Concept 32-97, is pushing the limit of super-minicomputers beyond 10 Mips. DEC, made confident by the quantities it has sold (25,000 Vax) is also betting on software: it introduced the first two items in a relational data-base management line: RdB/VMS and RdB/ELN. At the bottom of the line, we should mention the Vax-1 and Vax 11-725 microcomputers, table-top models compact enough to fit on a desk. The Vax-1 microcomputer, in par-

ticular, is a multi-user all-purpose system that can also be used as a central processor in single-user graphic applications, in machine and industrial process control, and in scientific and management applications. Declared power: 35 percent of that of an 11-780 model, the reference standard in the series, for a really affordable price: under 150,000 francs. In the same category--"32-bit professional microcomputers"--Perkin Elmer is answering with model 7350 in its 7000 series.

A newcomer among minicomputer manufacturers, AT&T was introducing its machines at the Olivetti booth, Olivetti being in charge of European sales. The line includes six 32-bit models operating under Unix, 3 of which are comparable to the Vax. These are the 3B-20S, which can manage up to 100 terminals, the twin-processor 3B-20A, and the failure-tolerant 3B-20D.

Professional Microcomputers: Proliferation of 16-Bit Models

Another interesting fact as far as 32-bit super-minicomputers are concerned is the announcement made by Bull that it had signed an agreement with the U.S. Ridge-Computers to manufacture a French machine for industrial and scientific applications, to compete with the present Mitra and Solar. Certainly, no model was shown at the Bull booth, but they can be expected to appear on the market before the end of 1984, with a very competitive price/performance ratio compared with the Vax.

A last stop at Nixdorf which, for the first time, was showing the error-tolerant 8832 system of the U.S. Auragen. Designed for industrial applications, this machine is also interesting in other respects. It makes it possible to process several applications simultaneously on screen, through windows (as on the Apollo computers). The basic model includes two computers and can be expanded to 32 computing units, which means that it achieves near 100 percent availability.

In professional microcomputers, there is a boom. A proliferation of compact, portable 16-bit models, nearly all of which use the same processors (Intel 8088 or Motorola 68000). They nearly all have the same technical characteristics: 128 to 640 Kbyte [8-bit bytes] of core RAM, 10-15 Mbyte hard disk, one or two 360-Kbyte diskettes, Concurrent CP/M-86 or MS-DOS operating system.

These models will support all the current leading software packages: Lotus 1-2-3, Multiplan, Vision, Supercalc, Word Star, etc. Actually, any standard office automation software for word processing, business graphics, tabulations, etc. And, as if this uniformity was not enough, manufacturers--IBM excepted--have all joined in proclaiming that their "personal computers" are compatible... with IBM's. In this outcry, we can distinguish tenor voices: Philips (PC 31000), Commodore (PC), Olivetti (M21 and M24), ICL [expansion unknown] (PC) and that of a new choir member in that register: Sperry Univac (7 versions of its PC, from model 10 to model 50).

Industrial Application Software

More discreetly, for we are dealing now with application software--the underwater part of the data-processing iceberg--Bull was introducing a series of industrial application programs. This is the first stage in integrating commercial management, production management and manufacturing follow-up software into a consistent modular whole. On the one hand, Steeb, a German data-processing consultant, developed commercial management software packages to complement IMS-TD [Information Management System-Transmitter/Distributor], the production management program already offered by Bull. On the other hand, Honeywell Italy just added to Bull's catalog a terminal for the acquisition of industrial data of all types, the BDG 4000, which is quite versatile since, in addition to an "industrial-environment" special keyboard, it includes a reader for bar codes, punched cards and magnetic cards. The next step will be the automatic connection of the Strim 100 computer-aided design and manufacturing software with the IMS-TD production management software, through a compatible-nomenclature file.

Programmable Controllers: The New Generation

Are programmable controllers turning into industrial computers? One may raise the question with respect to the Siemens S5-135 U and the Festo FPC 404 models, although they are essentially programmable controllers. These two new products are equipped not just with one, but with several microprocessors.

Also, it is now possible to load not just one, but several programs simultaneously. The S5-135 U is a good illustration of this technological development. Each processor can be connected independently to a console (up to four can be connected). Each processor is equipped with its own memory and its own internal bus and carries out 32-bit floating-point operations. The four central processors can be complemented by four communication processors: this makes it possible to add computers, other controllers, printers or displays. With 1,024 inputs/outputs, this middle-of-the-line model is priced at only 25,000 francs for the basic version.

As for the Festo FPC 404, it may be classified as a bottom-of-the-line model because of its 128 inputs/outputs, but its performances put it in a class by itself. A multiprocessor, in its maximum configuration it operates with six central processing units, six EPROM memory boards and two input/output modules. In this configuration, 192 Kbytes of program memory are available to the user (i.e. 96 programs and the possibility of processing 24 branches simultaneously). With its 96 counters and 48 other timing devices, this controller can be programmed in Z-80 assembler, in industrial Basic and in "Grafcet" (as Festo's own graphic language is related to Grafcet). In this case too, the quality/price ratio makes you wonder: 11,000 francs or so for 32 Kbytes of memory and 16 inputs-8 outputs.

Since Festo provided for a software library, the purchasing criteria for a controller are about the same as for a computer. At any rate, data processing is invading programmable controllers. Like any other computer manufacturer, Kloeckner Moeller, which is already using an Apple II to program its PS 22 and 24 models has caught IBM-compatibility fever: the Sucos PS 32 W,

which was added to the PS 21, 22 and 24 line, is equipped with a system software suitable for all IBM-compatible microcomputers.

The Network Could Make The Difference

Data processing means communication, and there was no lack of peripherals at Hannover. The Siemens color-screen display system (Disit) uses the memory of the controller (an S5-150) to store images that will display on the screen the installation layout and all numerical data required for following up and monitoring. The Advisor, introduced by Allen Bradley, is another way to open a dialogue between man and the installation. The color-screen control and monitoring station make it possible to process, observe, query or interrupt any station connected to the brand's Data Highway industrial network.

Network: there is the fatal word. In Hannover, we expected to see a proliferation of this type of architecture, designed to enable several controllers to dialogue through a communication bus. Thus, a large controller could be replaced by several bottom-of-the-line devices: a market on which war is raging and on which the network used could well make the difference. Each manufacturer was presenting its new model including less than 128 inputs/outputs: Texas Instruments (TI 100), Allen Bradley (MAC model), Mitsubishi (Melsec F series), Telemecanique (TSX 27-20), Siemens (S5-101 and 105), Kloeckner-Moeller (PS 21)... and others. They were all there (the joint model resulting from the merger between SMC [expansion unknown] and Merlin Gerin will be introduced in May). While all manufacturers realize what is at stake, none of them is currently offering a line that could be fully integrated into a network architecture. "This is a year to mark time," according to Jean-Pierre Beaudart, in charge of marketing at Telemecanique. Maybe not so for Telemecanique, however, a newcomer as far as networks are concerned, which offers one called Telway (to which its TSX 47 can be connected) and whose models TSX 60, 80 and 90 can now be connected to the Factor network (of the Apsis company).

Speed, Thanks To the Ethernet Local Network

One of the oldest networks Allen Bradley's Data Highway which can support up to 64 controllers, is offered with software such as NET 13 (which provides for dialogue with computers such as the PDP 11 or Vax of Digital Equipment), or PCIF 1000 (for Hewlett-Packard HP 1000 computers). Another veteran (with its Modway network) is Gould-Modicon which is just adding peripherals, such as the touch-screen Modvue.

Siemens shows the Rank Xerox local Ethernet network for automated office communications, its choice being also guided by considerations of speed and conformity with the IEEE 802 bus. Although no standard has been adopted as yet, this one appears to be preferred. As for Texas Instruments, it is offering its Tiway I network and is working on the Tiway II. A hard battle is in sight.

Siemens Is Adopting Grafcet

For its PG 675 and PG 135 consoles, Siemens adopted Grafcet as a programming language; Grafcet resulted from AFCET [French Association for Economic and Technical Cybernetics] and ADEPA [Agency for the Development of Automated Production] research. It was also presenting a software package, Dimos, for the automatic diagnostic of defects in Grafcet: it decomposes the operation of an automated device in stages and transitions, so that automatic failure-localization is easier. Any defect preventing passage from one transition to the next is immediately localized.

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CSO: 3698/418

BRIEFS

SWEDISH GALLIUM ARSENIDE TRANSISTOR--Stockholm (pp). Tiny high-speed transistors made from gallium arsenide, which operate three to five times faster than conventional silicon transistors owing to the greater mobility of the compound's electrons, have been developed by researchers at Rifa AB, Stockholm, a member of the Ericsson Group. The transistor, a metal field-effect transistor, is mounted in four groups on a chip measuring 0.35 x 0.49 mm. With this small size, thousands of chips can be mounted on an area the size of a fingernail. Each transistor measures 0.14 mm. The base, the layer in which the electrons migrate, in only 0.8 meters wide /probably 0.08 mm/. The electronic processes take place in an active layer of gallium arsenide. The free electrons which migrate from emitter to collector are generated here when a positive voltage is applied to the latter. The emitter and collector connections consist of a gold-germanium alloy; the base connector is aluminum. The number of electrons activated is determined by a control voltage applied to the base. Since the associated electrical field also occupies a small physical space, the electron movement reacts very quickly in response to changes in the control voltage. To date, the gallium arsenide transistor has been used primarily as a photo or laser diode in fiber optics circuits and as a low-noise MESFET. Thus, the transistor will make possible much faster sound and light transmission between satellites. /Text/ /Leinfelden-Echterdingen EEE in German 27 Mar 84 p 100/ 9160

CSO: 3698/400

SCIENTIFIC AND INDUSTRIAL POLICY

CANADA OUTLINES 1984 RESEARCH, DEVELOPMENT BUDGET

Paris AFP SCIENCES in French 26 Apr 84 pp 12-13

[Text] Ottawa--The Canadian government will devote 1.245 billion Canadian dollars to technical development during 1984, either through direct aid--financial R&D aid for various programs (industrial and regional development aid, industrial research aid, aid for defense industry productivity, aid to industry-laboratory projects)--or through fiscal incentives (investment or scientific research tax credits, aid for scientific and technical information, training aid, and so on).

According to a document recently published by the Ministry of State for Science and Technology, entitled Canadian Government Support for 1984 Technologic Development:

The fiscal incentives for 1984-1985 have been set at 325 million dollars, compared to 225 million for last year;

Financial R&D aid through the regional industrial development program will amount to 110.2 million in 1984-1985, against 102.7 million during the previous budget year;

48 million dollars will be allocated to the industrial research aid program;

130.7 million will be earmarked for the defense industry productivity program, a significant drop from last year's 169.2 million dollars;

29 million dollars have been reserved for industry-laboratory projects, compared to 23.9 million in 1983-1984;

To support the training program, the Fund for Professional Competence Improvement has disbursed an estimated 140 million dollars in 1983-1984; the amount set aside for this year has not been specified;

300 million dollars will also be spent on technical research to be performed under government contracts by industrial companies; and so on.

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MARKET SHARE, STRATEGY OF FRG'S NIXDORF IN U.S.

Munich INDUSTRIEMAGAZIN in German Feb 84 pp 51-54

[Text] In just 15 years, the Paderborn Computermaker Nixdorf worked himself up to the position of the biggest European in his branch on the United States market. But the enterprise still has to correct a series of strategic weaknesses.

For a long time, the Westphalians were operating in the red in the United States. The first affiliate of the Nixdorf Group, Nixdorf Computers, Inc. which was founded in Chicago in 1972 and which at that time serviced about 1,000 systems delivered from Germany, soon went into high gear after starting out when it teamed up with the young Entrex Corporation, a data collection system maker. The product earned much money and made Nixdorf a leader on the market.

When Heinz Nixdorf took over Entrex in 1977, his American sales volume doubled overnight to $60 million and in 1980 he already topped the 100-million marker. But then a tactical mistake threatened the buildup achievement: The attempt to sell the rather expensive, smaller Nixdorf systems through the Entrex sales network failed; Nixdorf learned a rather costly lesson and had to send out lots of pink slips.

"At that time we did not realize," admits deputy board chairman Klaus Luft today in a rather self-critical vein, "that the independent American entrepreneur, when it comes to technical equipment, demands simple, low-cost products which will bring him results in dollars and cents as quickly as possible." This buying habit runs counter to the typical Nixdorf supply of complete "intelligent problem solutions" in which, if anything, bigger users are more likely to be interested in the United States. But in the meantime such customers have also been found: One of the first major new customers, for example, is the United States Department of the Interior which is using Nixdorf computers for population statistics. Next came NEA [National Education Association], the Saga restaurant and snackbar chain, as well as Trailways, a bus company.

And now the figures also check out: In 1982, Nixdorf was able to win the biggest foreign market of the people in Paderborn in the United States with a sales share of 15 percent (at that time a total business volume of DM2.28 billion); this, for the first time, was a very slim gain of $1.7 million out of a total sales volume of $145 million. During FY 1983, which has just ended, the result will probably rise to earnings of $2.3 million with a sales volume of $155 million.

America, the Pacesetter

Even if things perhaps later on should go downhill once again, Nixdorf's determination to operate in America is today at any rate unmistakeable. The enterprise now sells not only computer systems there but also researches, develops, and makes them there. In the future, the commitment in America will at any rate become even more indispensable than it has been so far, commented Luft. "Only those manufacturers who are fully active on the American market can lay claim to worldwide standing because the tempo there in the development of data processing so happens to determine the trend in Europe and Japan." Michael Anderson, president of NCC, loves to illustrate the dynamics of this market with the observation that, over the past 4 years alone, 5000 new enterprises with at least $1 million sales grew in the computer branch. This means that Nixdorf must directly assert himself against about 20 high-powered competitors and that relentlessly challenges the enterprise's sales smartness, power of innovation, and quality standards.

Nixdorf at any rate is well armed for battle. In the form of the NCC, the Group has its own hardware affiliate; in the form of the NCSC (computer software company), in Richmond, Virginia, which was acquired in 1980, it has its own system company; and since 1981 finally it has also had its own small technology center in Santa Clara, right in the middle of the now proverbial "Silicon Valley."

Moreover, Nixdorf concluded license and sales agreements with the software firms of Spartacus Computer, Inc. and Auragen Systems Corp. on the east coast of the United States; it also signed delivery contracts with the Californian venture enterprises of LSI Logic Corp. and Shugart Corp. They make Gate-Array circuits and disk storage systems.

Market Share Too Small

Overall the Group nows employs about 1,700 persons over there, including 1,200 in sales and service, 250 in research and development as well as 250 in production. Production, by the way, is concentrated primarily in a plant in North Reading, near Boston, in the "Computer Belt" not far from the historical "Route 128" with its numerous high-tech firms.

Over the next several months and years it will be important above all for Michael Anderson and his assistants decisively to increase the rather slim share of about 1 percent of the United States computer market. At this time, NCC is servicing 4,250 customers and is maintaining around 8,500 installed systems. The plant in North Reading can produce 800 systems annually; but of that number only 600-650 are completely assembled there; the rest--coming from Germany--merely goes through a final test in the factory. As former IBM manager, Anderson knows that figures like these are no big thing.

Of course, Nixdorf today refers to itself as the biggest non-American computer enterprise in the United States; this is confirmed by the latest ranking published in the technical periodical DATAMATION. But as many systems as NCC has set up in the meantime were sold on the average each month by Anderson's former employer.

Concentrating on Bank Automation

Nixdorf's current sales and service organization in the United States--assuming suitable further investments--however should entirely be in a position to double or perhaps even triple the market share by the end of the decade. Today it reaches more than 100 cities in the United States and by 1984 it will probably, at least in terms of sales, record even better results than during the recession-plagued years before that.

The core is NFENET (Nixdorf Field Engineering Network) with 700 employees who are constantly getting advanced instruction in an in-house training center. The Network controls the employment of customer service technicians and system repairs and here the state of the art includes long-distance care of equipment by phone. At the same time it supplements NCC market strategy through constantly updated statistics from the sales and system-utilization history of the customers as well as through the assembly of their systems and the way they prove themselves in practice.

Among other things, Nixdorf sells work-station-oriented computer systems, word-processing units, and electronic cash registers in the United States.

"As part of bank automation--which is making tremendous progress because of the progressive legal liberalization of this economy branch in the United States--the finance field in the future will undoubtedly have to be a main point of our acquisition," emphasizes Luft in his capacity as chairman of the board of NCC (Nixdorf Computer Corporation) with headquarters in Waltham, Massachusetts. Winning the Warrant brokerage firm as customer represents an initial victory on this difficult part of the market; that firm wants to use Nixdorf systems to handle and supervise securities transactions with banks.

As for electronic cash registers, Luft and Anderson hope to be able profitably to sell Nixdorf knowhow acquired in Germany and Europe. That would appear to be more difficult in the case of electronic telephone extension-station systems for which there is basically a tremendous market in the United States but which is currently also hard-fought.

While technical knowhow flows through the United States through such products, much knowledge is rooted in the opposite direction, to the other branches of Nixdorf group, from the development work of the software company (NCSC), and from Spartacus and Auragen.

Because it would like to expand its business in Japan (where there is also a technology center) and in the ASEAN area during the coming years, it would be lined up more and more clearly worldwide against competition from the United States and the Far East and it therefore more than ever before depends on constantly staying on top of new technical trends.

"In this connection of course we are doing less basic research and instead we rely more on the innovative conversion of technologies into market-oriented and user-oriented products" Luft pointed out.

NCSC and Spartacus are currently giving priority here to work on better operating systems for IBM-compatible systems by Nixdorf. The enterprise boasts that it has in the meantime grown to become the biggest PCM producer with 400 installations (average price tag DM700,000). NCSC is particularly concerned with the DOS operating system, while Spartacus is concerned with VM. Improvements in these systems enable the user to employ distributed data processing in interconnected systems (clusters) made up of different computers and peripheral units.

In cooperation with Auragen Systems in Fort Lee, New Jersey, Nixdorf developed error-tolerant computer systems of which the first prototypes are to be installed in 1984 at some German colleges and in selected production enterprises in the FRG.

The technology center in Santa Clara, finally, with, for the time being, four full-time permanent staff members as well as visiting technicians from Germany, is handling active and passive development tasks:

Maintaining contact with the makers of testing instruments for in-house system development by Nixdorf;

Exchange of specifications between the Berlin Technology Center of Nixdorf and American innovators in order to be able as early as possible to influence technical developments on both sides;

Cooperation with selected firms, such as LSI Logic and Shugart, as well as others in the case of individual development projects.

"In methodological terms, Nixdorf's strong points here are always to be found in the system tie-in of innovations, in requirements for the interface structure, in ergonomics, and in diagnosis, testing, and monitoring," explained Guenter Frommel, the center's director. "In objective terms, we are making contributions, for example, to periphery control units, to subscriber circuits for electronic direct dialling, for optical storage systems, as well as for adaptations and applications for the Unix operating system which runs on high-grade personal computers."

In-house development at Nixdorf so far has only failed to cover semiconductor technology; on the other hand, the group is working together with the Karlsruhe Technical University and Stanford University on expert programs as a step preliminary to "artifical intelligence."

Over the years, Nixdorf, according to figures supplied by Luft, invested about $50 million in the United States; that went for the purchase of companies, for in-house expansion of the Group in North America, but of course also to make up losses.

Today the group's American branch is capitalized with $45 million although it still does not yet really finance itself in spite of the positive result of both preceding years. For that, the commitment first of all is lacking that full cash flow which many American firms in the EDP field and in high technology get quite generally from Pentagon orders.

"A piece of that pie would also be good for us," Luft assumes. "It would in the final analysis be also only a fair remuneration for all the purchases which European NATO partners are constantly making in America."

Conversely, the commitment in the United States by the people from Paderborn is still lacking one essential element to be able fully to deserve the description "strategically present": Raising capital on Wall Street according to the example of other European enterprises, such as, for example, the Swedish Ericsson Group last year.

This kind of chess move would first of all certainly speed up Nixdorf's expansion on the United States market. Besides, however, it would undoubtedly also more lastingly promote the name recognition angle, much more so than an advertising budget of $1.5 million was able to do the year before. "It so happens that financial news have the best chance of being consciously perceived by American public opinion shapers," a Nixdorf spokesman believes.

Initiatives in that direction however can be expected at the earliest after Heinz Nixdorf and German Bank in the summer of 1984 have made their decision as to the final destination of the share package of 25% (DM160 million) which are parked in that bank.

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CSO: 3698/422

CURRENT STATUS, FUNDS OF MAIN FRG VENTURE CAPITAL FIRMS

Munich INDUSTRIEMAGAZIN in German Feb 84 pp 66-68

> [Text] A year ago, the first venture capital companies began to collect money hereabouts for their ambitious projects. Now the cash registers are jingling but the financiers keep sitting on their cash. As of now, only one venture capital enterprise in Munich has been able to show specific partnership deals.

Proudly, Dr Hellmut Kirchner, business manager of the Munich Techno-Venture-Fonds (Siemens Matuschka Group, T.A. Associates, Advent Management), in the middle of January already presented the second promising partnership. With DM1 million, the Group joined the Nuernberg enterprise of AID (Automatisierung Informatik Datentechnik), which makes software tools.

Last year already the Munich Fund had participated with DM125 million in the Wunstorf firm of Feinfocus which had developed a particularly efficient x-ray system. The contract partners arrived at an agreement in less than 2 months and entrepreneur Alfred Reinhold at the same time managed to secure for himself the active support of his financier for his push into Japan and the United States.

Of course, so far only Deutsche Wagnisfinanzierungs-Gesellschaft mbH in Frankfurt (around 30 projects in 6 years) and the Munich Techno-Venture Management Gesellschaft (see also table below) have been able to come up with such specific partnership deals. Most of the other venture capital financiers--who sprouted like mushrooms last year--for the time being are standing there with empty hands.

In the autumn of 1983, for example, the brand-new venture financier Uwe Gabbert, boss of the Mainz Kapital & Wert Genossenschaft fuer Vermittlung privater Geldanlagen e.G., presented his "Inno-Wert Fonds 1." At the same time he particularly introduced four specific projects in which his investors were supposed to participate. That was perhaps somewhat premature because one of the supposedly sure investors--the Limbach Aircraft Engine Company, in Koenigswinter--withdrew rather soon.

Out of a total of 150 inquiries, which the Mainz financier has received so far (see table), 22 were subjected to a detailed examination. Today only 5 enterprises are still in the running and Gabbert, who by now has become much more cautious, does not even want to mention them by name. But all projects are in the negotiating phase although not a single contract has so far been wrapped up.

For some venture capital companies, the biggest problem for the time being seemed to be the procurement of capital; in contrast, for less experienced enterprises, it turns out today to be no less difficult correctly to distribute the money that was gathered from viewpoints such as minimizing the risk and maximizing the yield. Thorough and therefore long-drawn-out project reviews but also tough negotiations prevent the rapid practical application of the venture financing idea.

"A maximum of 4 months should pass from the first contact with the enterprise up to the investment phase," explained company consultant Thomas Bechtold, who is looking for capital for the Stuttgart DVC Group. The review phase however can also last longer because "many people come to us only with their idea."

Long drawn out contract negotiations also in many instances delay the brisk processing of venture capital deals. "We simply did not figure on the enormous time expenditure," complained, for example, Juergen Weidner, president of Boeblinger Venture Capital AG; nevertheless, he believes that the conclusion of 15-20 partnership contracts this year is still a realistic target. So far, however, the Boeblinger projects have not gotten beyond the preliminary contract stage. Negotiations always turn out to be quite tough especially when forms of participation ("we are trying for a partnership share of 50%") and control mechanisms are at issue.

"The mentality-influenced inhibition threshold in the case of medium-sized enterprises hereabouts is a considerable obstacle in German in-house capital business," Karl-Heinz Fanselow, the business manager of the Frankfurt Wagnisfinanzierungs-Gesellschaft, observed a long time ago. "The medium-sized business operator prefers to remain small and alone."

In addition, Fanselow also believes that he has detected another cause for the rather sluggish start of venture financing in Germany: "There is no lack of capital but there is a lack of good projects." Experienced management teams, which found enterprises, spinoffs and buyouts are missing hereabouts, complains the Wagnisfinanzierungs boss. Finally, "the banks themselves handle very much through loans."

Now of course the banks are getting more and more into the venture capital business also officially. In December 1983, the Berlin Industriebank, the Industriekreditbank, and Deutsche Bank Berlin founded the "VC-Gesellschaft fuer Innovation mbH" (DM10 million capital); it mostly wants to help enterprises in Berlin.

The "S-Siegerlandfonds 1," which was launched by Rolf Brunswig, member of the board of the Siegen Savings Banks, aroused great interest among enterprises and company founders during the very first few weeks. Dr Klaus Nathusius, an expert on the venture capital scene and chairman of the board of governors of International Venture Capital Partners, Luxembourg, is sure of what he says: "There is a great demand in the FRG."

More Capital Than Projects
Partnerships and Technology Sectors of Venture Capital Companies

Venture Capital Companies	Specific Partnerships	Projects in Negotiating Phase	Sectors, Technologies	Offers, Structure of Offers	Investor, Capital
DVC Venture Capital Company, Stuttgart; broker: Thomas Bechtold, company consultants, Postfach 463, 7180 Crailsheim, phone: 079 51/66 55	To be expected shortly	Eight enterprises from the fields of microelectronics, publishing, textile industry, and production automation	Commitment in growth markets, especially in microelectronics, office automation, production automation, CAD/DAM, agricultural technology, biotechnology, gene engineering, data processing and communications technology	36 enterprises from all sectors of the economy	No data
Genes GmbH, Horbeller Strasse 10-14 5000 Koeln 40, phone: 0 22 34/5 90 76, "International Venture Capital Partners," Luxembourg	None; investments to start only after reaching DM15 million in capital	12 enterprises, including two newly founded, three young enterprises during the first growth phase, four during the second growth phase, two management buyouts and one turnaround-situation, mostly high-technology sector	Computers and peripheral units, communications, office automation, robots, and industrial and regulating equipment, electronic applications, laser applications, medical instruments and medical electronics, biotechnology and gene engineering, optical and sensor engineering, software and miscellaneous	About one inquiry per day; financing requirement goes through all age and size categories	Five A-stockholders (who also invest personally), eight B-stockholders; capital: DM11.8 million

Capital & Wert Genossenschaft fuer Vermittlung privater Geldanlagen e.G., Erthal-Strasse 1,6500 Mainz, phone: 0 61 31/60 60; "Inno-Wert Fonds 1."	None; only after closing of fund.	Five enterprises in the final selection round, from the fields of laser technology, polymer chemistry, medical technology, microelectronics, electronic heat regulation systems	Projects from the fields of energy, environmental protection, construction materials, robot control, biochemistry, and others are current being reviewed	150 inquiries to Kapital & Wert and Schmuecker and Partner enterprise consultants, mostly young technically-oriented enterprises	710 investors with DM9.1 million capital; target: DM20 million
Techno-Venture Management Gesellschaft, Ismanninger Strasse 57, 8000 Muenchen 80, Phone: 0 89/ 4 18 01-0.	Feinfocus, Wunstorf; DM1.5 million for a particularly efficient x-ray system; AiD, Nuernberg; DM1 million for software tools which will relieve the programmer of routine work (for microcomputer systems)	Five to ten enterprises from the fields of office automation, bioelectronics, computers (hardware, software, periphery), data bank and data transmission systems, energy technology, communications technology, medical technology, measurement, testing, and regulating technology	Office automation, bioelectronics, computers (hardware, software, periphery), data bank and data transmission systems, energy technology, communications technology, medical technology, measurement, testing, and regulation technology, special chemicals.	About one inquiry per day from all fields; including numerous individuals (inventors); all young enterprises have financing needs, especially if they reveal two-digit growth rates per year.	Three investors; DM60 million

Venture Capital AG, Roehrer Weg 7, 7030 Boeblingen, phone: 0 70 31/27 20 08	None; only briefings so far.	Five enterprises from electronics (process engineering), video and image disk technology, medical technology.	Commitment in electronics, video and image disk technology, medical technology, environmental processing, biotechnology	70 projects in processing, individuals, small and medium enterprises, major enterprises from all fields	So far no investors from the open Market; DM1 million capital stock; increased to 20 million planned for the spring of 1984.

SCIENTIFIC AND INDUSTRIAL POLICY

FRG SOFTWARE FIRM RECEIVES VENTURE CAPITAL FUNDING

Leinfelden-Echterdingen DIE COMPUTER ZEITUNG in German 4 Apr 84 p 33

[Text] TVM(Techno Venture Management Company) of Munich is participating in the Nuernberg Engineering Company for Microcomputers, Hard- and Software AiD with DM1 million.

TVM is a joint venture enterprise of the Matuschka Group in Munich of T.A. Associates Boston, United States, as well as the Venture Capital Partnership Company of Siemens AG and David Cooksey (Advent Management London). Through AiD the second enterprise obtained DM100 million risk participation from the investment pool. For this young enterprise, this support is at the same time a kind of award because TVM investment policy is concentrated on enterprises which promise above-average growth. The investment objective is to develop the partnership within 5-10 years in such a manner that a value increase can be achieved by going to the stock exchange or through a sale together with the enterprise.

The statistics for the last several years point to an upward trend for AiD. Engineers (FH [College of Finance?]) Wolfgang Bialas and Peter Barski opened their development bureau for software applications only in Ohtober 1980. In 1981-1982, they were able to achieve a sales volume of DM1.6 million with 14 employees.

AiD activities are aimed at three areas:

1. AiD develops and produces software tools.

2. AiD makes customer-oriented or company-oriented application software.

3. It leases microcomputer development systems.

Especially the leasing of AiD-owned MC development systems proved to be a big hit. "We get 25 percent of our total sales volume from this activity," explained Peter Barski. In the leasing business and in the development of application software, the emphasis is on sales; but in the case of software tools, the emphasis is shifted to the concept of investment. This is where we come to the idea which Barski and Bialas so far have already spent DM400,000 on:

CEPIX Software Tools. Microcomputer programs can be designed with the help of the individual tools in this CEPIX series. The system consists of a structogram editor, a precompiler, a debugger, and a structure transformer.

With about DM6,000 one can afford getting into the world of these software tools from Nuernburg. According to studies by Peter Barski and Wolfgang Bialas, that means more and more enterprises will join in. This is why they will not only push the introduction of the system on the market but also improve it constantly.

To carry out these plans and to increase the personnel force by exactly 100 percent and to step up aggressive marketing, the two young businessmen kept looking for capital suppliers who they have now found in the form of TVM. The risk financiers were persuaded by their enthusiasm and conviction in addition to the products turned out by AiD. The contract was signed, sealed, and delivered on 18 January 1984.

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CSO: 3698/422

SCIENTIFIC AND INDUSTRIAL POLICY

AUSTRIA TO FUND MICROELECTRONICS, COMPUTERS IN 1984-1987

Leinfelden-Echterdingen DIE COMPUTER ZEITUNG in German 14 Mar 84 p 39

/Article: "Austria to Support Microelectronics With Research Grants and Tax Incentives"/

/Text/ Vienna (vwd). A new support program in the fields of microelectronics and information processing for the years 1984 through 1987 has been announced to the Austrian public by Science Minister Heinz Fischer. It will become effective on 1 September 1984 and provides for 10 technological focal areas which have been deliberated and ranked by the Council for Science and Research.

--Semiconductor technology, including applications (economically relevant for Austrian semiconductor production at Siemens-OEIAG, Villach and VOEST-Ami, Unterpremstetten plus numerous user firms in such areas as consumer and automotive electronics),

--Sensors (economically important in instrumentation, guidance and control and in the medical and environmental technologies),

--Microprocessor technology (universally relevant economically, especially in equipment building, process technology, industrial facilities construction, etc.),

--Communications technology, including end equipment (of economic interest to the Austrian telecommunications industry, for example Kapsch, Schrack, ITT, Datentechnik and Motronic who are the primary partners of the Austrian Postal Ministry in operating the CRTtext service. Nearterm goal is the development and production of an Austrian "People's (mini) Computer."),

--Process-data processing (an economic requirement for all goods producing branches for process innovation and EDP-based production control, especially in the nationalized industries and the electric power industry),

--Computer graphics and image processing (economically important for producers of computer peripherals, for instance Mannesmann-Tally, Wien-Inzersdorf and SEI, Salzburg-Groeding, also important for numerous applications in surveying and efense),

--Artificial intelligence (of interest for software producers, for instance for natural-language databank interfaces and expert systems),

--Advanced robotics (of economic interest for the automated factory, especially in machine building, facilities building and chemical process engineering),

--Flexible automation including computer-based design and manufacturing (CAD/CAM),

--Technology tracking and assessment in microelectronics and information processing,

--The management of maintenance and detailed formulation of these technology focal points will in each case be delegated to a research institute that has gained experience through joint efforts with Austrian companies within the framework of the Research Concept '80 program. In order to assure flexible cooperation with Austrian firms, these institutes were selected mainly from the circle of nonuniversity-connected, joint-use research institutes.

With joint agreement and consent of the institutes involved, the following institutions have been commissioned in the fields specified: in the area of microelectronics, the formative "Society for Microelectronics" /GME/, and in the area of information processing the "Austrian Computer Society" /OCG/.

As additional task-related research funds for the support program, S 30 million will be allocated this year and S 70 million per year from 1985 on. For converting research results to practice, research funds of up to S 250 million per year will be reserved starting in September. However, the grants will be limited to S 10 million per year per company.

The support program is founded on a 1981 study concerning application, proliferation and effects of microelectronics in Austria which was conducted by the Austrian Academy of Sciences and the Austrian Institute for Economic Research under a contract from the Ministry of Science. The study report calls for stronger application of the microelectronics and information-processing technologies as prerequisites for improving the structure of the Austrian economy and securing its competitve capability in international markets. At the same time, in Fischer's opinion, the consciousness of the application potentials of new technologies is still underdeveloped in Austria. Also the existing tax potentials are not presently being fully exploited. A study is underway to determine if incentives can be created for research and development within the framework of a general tax reform.

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BRIEFS

DUTCH-GERMAN HIGH TECH COOPERATION--The Hague, April 27--The Netherlands and West Germany intend to work together more closely in the field of technology. Minister Van Aardenne (economic affairs) discussed this topic for two days with the minister of research and technology, Riesenhuber. The government officials talked about cooperation in information technology, biotechnology, renewable energy resources and environmental technology. In the area of information technology, the two ministers considered the extent to which Dutch and German firms will be able to work together and inquired into the possibilities for such cooperation offered by the European program for stimulating information technology (Esprit). The two ministers further exchanged ideas on how information technology can be stimulated. Both countries have plans to this end on the drawing board--the Netherlands has its information-cash stimulation plan, while Germany recently announced that it will be putting upwards of 300 million marks into information technology. Since the stimulation plans are at similar stages of development, the Netherlands and Germany will be exchanging more information on the matter and will coordinate policy decisions where possible. In the area of biotechnology, contacts exist between the Dutch Biotechnology Program Commission and the Federal Ministry for Research and Technology. Cooperation and the exchange of a number of programs will be discussed later this year. The Netherlands and Germany will also will also be cooperating in the area of renewable resources, particularly wind energy, where various German-Dutch initiatives are already in motion. Minister Van Aardenne announced his desire to invite a delegation of German industrialists to come study the possibilities in the technological area this fall. (GENERAL NETHERLANDS PRESS AGENCY) [Text] [Rotterdam NRC HANDELSBLAD in Dutch 27 April 84 p 12] 12620

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6/13/84